

CLAIMS:

1. A process for manufacturing a steel strip with low aluminum content, comprising:
hot-rolling a steel strip comprising between 0.050 and 0.080% by weight of carbon,
between 0.25 and 0.40% by weight of manganese, less than 0.020% by weight of aluminum,
and between 0.010 and 0.014% by weight of nitrogen, the remainder being iron and
inevitable trace impurities, to form a strip;

subjecting said strip to a first cold-rolling, to produce a cold-rolled strip;

annealing said cold-rolled strip, to form an annealed cold-rolled strip;

optionally, subjecting said annealed cold-rolled strip to a secondary cold-rolling;

wherein said annealing is a continuous annealing comprising:

raising the temperature of the strip to a temperature higher than the
temperature of onset of pearlitic transformation Ac_1 ,

holding the strip above this temperature for a duration of longer than 10
seconds,

rapidly cooling the strip to a temperature below 100°C at a cooling rate in
excess of 100°C per second,

thermally treating the strip at a low temperature ranging between 100°C and
300°C for a duration in excess of 10 seconds, and

cooling the strip to room temperature.

2. The process according to claim 1, wherein after said rapidly cooling and prior to
said thermally treating, a plastic deformation operation is performed comprising an
elongation of the strip with a percentage elongation ranging between 1 and 5%.

3. The process according to claim 1, wherein the strip is maintained during said
annealing at a temperature between said Ac_1 and 800°C for a duration ranging from 10
seconds to 2 minutes.

4. The process according to claim 1, wherein said rapidly cooling is carried out at a
rate between 100°C and 500°C per second.

5. The process according to claim 1, wherein said thermal treatment comprises maintaining the strip at low temperature ranging between 100°C and 300°C for a duration ranging between 10 seconds and 2 minutes.

6. The process according to claim 2, wherein said plastic deformation operation by elongation of the strip comprises planishing under traction.

7. The process according to claim 2, wherein said plastic deformation operation by elongation of the strip comprises rolling.

8. The process according to claim 1, further comprising manufacturing a container with said steel strip.

9. A steel strip, produced by the process of claim 1.

10. A steel sheet with low aluminum content, comprising:
between 0.050 and 0.080% by weight of carbon,
between 0.25 and 0.40% by weight of manganese,
less than 0.020% by weight of aluminum, and
between 0.010 and 0.014% by weight of nitrogen, the remainder being iron and inevitable trace impurities, wherein
when in an aged condition said sheet comprises a percentage elongation A% satisfying the relationship:

$$(750 - R_m)/16.5 \leq A\% \leq (850 - R_m)/17.5$$

where R_m is the maximum rupture strength of the steel, expressed in MPa.

11. The steel sheet according to claim 10, further comprising:
at least one selected from the group consisting of COTTRELL atmospheres and epsilon carbides precipitated at low temperature; and
a grain count per mm^2 greater than 30000.

12. A container, comprising the steel sheet according to claim 10.